

NON-PUBLIC?: N
ACCESSION #: 8904130020
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Indian Point Unit No. 2 PAGE: 1 OF 04

DOCKET NUMBER: 05000247

TITLE: Reactor Trip - Overpower Delta T
EVENT DATE: 02/22/89 LER #: 89-002-00 REPORT DATE: 03/30/89

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: John Ellwanger, Principal Engineer TELEPHONE: (914)526-5182

COMPONENT FAILURE DESCRIPTION:
CAUSE: A SYSTEM: LD COMPONENT: PSF MANUFACTURER:
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT: LER 89-02

On February 28, 1989, while the plant was at full power, a reactor trip occurred on an overpower Delta T signal.

Immediately prior to the trip, an instrument air line for the control of the heater drain tank discharge control valves parted at a soldered connection. The resultant loss of instrument air caused the discharge valves to go to the full open position. A heater drain tank low level signal tripped the heater drain tank pumps. A third condensate pump, which would have normally started under these circumstances, had its auto-start controls out of service due to a routine surveillance test.

Pump loss was observed in the control room, and plant operators reduced turbine load and inserted rods while simultaneously placing the third condensate pump in service manually. Approximately three minutes into the event the reactor tripped. With the load being reduced and rods . inserted, the delta flux in the core increased from - 4% to greater than - 20%. Because of the delta flux penalty, the reactor tripped when the loop delta T exceeded the lowered trip setpoint during the transient.

All rods inserted on the reactor trip signal, and all safety systems 1, functioned as designed.

END OF ABSTRACT

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse 4-loop pressurized water reactor

IDENTIFICATION OF OCCURRENCE:

Reactor trip on overpower Delta T signal

EVENT DATE:

February 28, 1989

REPORT DUE DATE:

March 30, 1989

REFERENCES:

Significant Occurrence Report (SOR) 89-117 .

PAST SIMILAR OCCURRENCE:

None

DESCRIPTION OF OCCURRENCE:

At the time of the reactor trip, the plant was operating at 100% power with an electrical output of 878 MWe. Except for several brief power reductions, the plant had been at full power operation since November, 1988.

The high steam flow first stage pressure test, PT-MI2, and the electric tunnel fan test, PC-EM5, were in progress at the time. LCO's were in effect for #21 electrical tunnel fan, #22 emergency diesel generator (right hand air start motor isolated), and rad monitor R-27. The reactor trip was initiated by an overpower Delta T trip signal following the failure of a one-half inch instrument air line which supplies the heater drain tank discharge control valves LCV-1127 and LCV-1127A. This line parted at a soldered reducer, and resulted in a loss of air to these valves. The loss of air to the control

valves allowed them to fail open, which led to the tripping of the heater drain pumps on low level approximately fifteen seconds later.

The heater drain tank pumps supply approximately 30% of the feedwater supply to the main boiler feed pumps. The loss of the heater drain tank pumps resulted in the suction pressure at the main boiler feed pumps dropping from approximately 320 psi to approximately 170 psi. An auto start signal to the third condensate pump would normally be generated

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DESCRIPTION OF OCCURRENCE: (continued)

by this pressure drop, however the auto start feature was defeated by design as part of the on-going monthly test PT-MI2, high steam flow and turbine first stage pressure testing. Because of this testing, the high pressure steam dumps were also in the "pressure mode", which prevented them from opening automatically when Tavg began to increase due to the initial load rejection.

Load was reduced to approximately 60% power from the control room following identification of the trip of the heater drain tank pumps. The third condensate pump (#22) was manually started from the control room approximately fifteen seconds after the trip of the heater drain tank pumps. Steam generator narrow range levels had started dropping by this time.

The main boiler feed pumps were operating at over 5000 rpm, and an attempt was made to control the pump speed manually from the Foxboro controllers. The feed pump speed control signal was manually rundown, however the rpm did not decrease. The pump controls were in "track and hold" due to rapid decay of pump suction pressure. Steam generator levels were increasing, feedwater temperature was decreasing, cold leg temperature was decreasing, and average loop delta T was increasing just prior to the trip.

While continuing with the recovery operations, the reactor tripped on overpower Delta T approximately three minutes into the transient. The overpower Delta T trip is a 2 out of 4 trip signal with a self-variable set point. With the load being reduced and the rods partially inserted, the delta flux increased from -4% to -20%. This resulted in a delta flux penalty which lowered the OPDT trip setpoint, and the reactor tripped when the loop delta T exceeded the lowered trip setpoint during the transient recovery operations.

ANALYSIS OF OCCURRENCE:

This event is being reported as an unplanned actuation of the reactor protection system. All systems worked normally and there was no impact upon the health and

safety of the public.

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CAUSE OF OCCURRENCE:

The transient was initiated by a local instrument air failure coincident with the routine performance of a condensate pump surveillance test. The air line, which supplies the heater drain tank pump discharge valves, parted at a soldered reducer. The failed joint was located within a Uni-strut channel near the heater drain tank pumps at El. 15'. Scaffolding was being erected in the immediate vicinity at the time, however it is unlikely that those activities resulted in a line shock or movement which caused the air line failure. The failed connection appeared to be poorly soldered, with no solder evident on approximately 50% of the joint.

CORRECTIVE ACTION:

The immediate corrective action taken was a repair to the soldered joint. The root cause of the deficiency was deficient workmanship which is likely isolate to this one instance. However, a review of the performance of instrument air lines and methods of detection of weak joints is planned.

ATTACHMENT 1 TO 8904130020 PAGE 1 OF 1

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March 30, 1989

Re: Indian Point Unit No. 2
Docket No. 50-247
LER 89-02-00

Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Station PI-137
Washington, DC 20555

The attached Licensee Event Report LER 89-02-00 is hereby submitted in

accordance with the requirements of 10CFR50.73.

Very truly yours,

Attachment

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